

ANIMAL EXTRACTS IN SURGERY

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TO the surgeon, the therapeutic value of animal extracts, when compared with other means at his disposal, is indeed small; nevertheless their importance is considerable, and increasing from year to year. Living as we do in an age when investigators in many instances seem to vie with one another to publish their results, it is often difficult for one clearly to see his way. In the following remarks I will endeavour to present some of the more important uses to which animal extracts may be put.

Adrenalin, obtained from the medulla of the suprarenal gland, is the animal extract most commonly used by the surgeon. In combination with cocaine and allied substances, it is in very general use. Barker, of University College Hospital, uses a solution consisting of distilled water $3\frac{1}{2}$ ounces, β -eucaine 3 grains, sodium chloride 12 grains and adrenalin chloride (1-1,000 sol.) 10 minims. Such a solution is non-toxic, so that the tissues can be safely infiltrated with considerable quantities of the fluid. By this means operations of gravity can be performed without pain, including such conditions as strangulated hernia, intestinal obstruction, thyroidectomy for Graves' disease, etc.

The next important use to which adrenalin may be put is in the treatment of shock. Whatever its causation, lowered blood pressure is a constant accompaniment, so that when adrenalin was found to contract blood vessels its employment in shock was a natural consequence. It soon became apparent that unless used intravenously and continuously it was useless owing to the fact that it is very rapidly oxidized and rendered inert. As employed by Lathan and English, a 1-30,000 infusion is passed directly into a vein until the blood pressure rises to about 130 mm. Hg., or if that is not attainable, then till there is a good radial pulse. When this is obtained the solution should then be allowed to run in very slowly about three or four drops per minute. In this way the patient is tided over till reaction sets in. Crile, on the other hand, uses a solution of 1-50,000 to 1-100,000 strength and advises in-

jecting the infusion directly into an artery and towards the heart. In that way he hopes to sidetrack the right heart.

A third use to which adrenalin is frequently put is hæmorrhage from deep seated surfaces, a good example being essential hæmaturia, or ideopathic hæmaturia. In this condition there is hæmorrhage from a kidney which cannot be explained by present knowledge or methods. And if the etiology is obscure, so, too, is the conclusion to be drawn from the published results of cases treated by adrenalin. Molnov gives 20-minim doses every four hours by mouth and claims to obtain results, although it is generally taught that *per oram* the drug is useless. M. Freund recommends stypticin in full doses. Hugh Young recently reported a successful case. There was a return some months later which, however, only lasted a few days. Russell reported a cure after a single injection of 15 c.c. of a 10 per cent. solution. On the other hand, Albarran in 1903 reported a case cured by a cystoscopic examination, and refers to a patient of Picqué and Reblaub who diagnosed that the hæmorrhage came from the bladder and did a suprapubic cystotomy only to find that the bleeding came from the kidney. The patient was sent back to bed and an operation on the kidney planned for the next day. The bleeding which had been of long duration ceased spontaneously and no operation was subsequently necessary. Others report the hæmorrhage having stopped from passing a ureteral catheter. While Kelly and Burnan admit that in a number of cases where they tried adrenalin it failed, they nevertheless think it should always be given a trial in essential hæmaturia. In hæmorrhage from the bladder more reliance can be placed upon it and it is frequently used to control such bleeding, the solution being injected into the viscus through the urethra. A further use for adrenalin is found when one wishes the operative field as bloodless as possible, the patient at the same time receiving a general anæsthetic. For instance, Mr. Groves when operating upon the posterior nerve roots for the visceral crises of locomotor ataxia infiltrates the part with suprarenal extract as a routine.

Osteomalacia is another surgical condition which has been undoubtedly benefited by the use of adrenalin. The treatment of this condition has been reviewed by Schriell, covering the last fifteen years. There were in his series 37 cases treated by phosphorus, 105 by castration, 36 by adrenalin, 1 by antithyroidin, 16 by pituitrin, 2 by milk from castrated goats, and 6 by x-ray. With but seven recurrences in the series treated by oophorectomy, Schriell claims that this operation still offers the fewest bad results,

being much preferred to treatment by hormones such as adrenalin and pituitrin.

A few years ago Leonard Bidwell of the West London Hospital undertook to investigate the effect of pituitary extract on the bowels after abdominal operations and recorded his findings in the *Clinical Journal* of September 6th, 1911. It was tried in 21 unselected cases the majority (19 cases) receiving three doses of 1 c.c. His conclusions were briefly as follows: The extract is able to overcome the temporary paralysis of the bowel due to exposure as evidenced by the early passage of flatus and the absence of abdominal discomfort. In only three cases, however, did the bowels act without an enema thus in every case except two a satisfactory action of the bowels was obtained after a simple enema. Two cases required an aperient. It was observed too that only two cases required to be catheterized. He advises that pituitrin be given as a routine as follows: one c.c. six hours after the operation, a second dose of similar size twelve hours after operation and a third eighteen hours after the patient leaves the operating room. No further dose is administered unless the patient complains of flatulent distension. The injection should always be made into the muscles since that made into the subcutaneous tissue is very painful. Another important use to which pituitrin may be put is in the prevention of shock. In the *Boston Medical and Surgical Journal* of May, 1913, Hill of Pittsburg records his experiences during the preceding two and a half years, his series embracing some eight hundred abdominal operations. All these patients before leaving the operating table were given 15 minims of pituitrin hypodermically. Then when the patient recovered from the anæsthetic, 15 minims more were injected, followed by three more similar doses at three hour intervals. In addition, all received enteroclysis and were put in the Fowler position with the head of the bed raised fifteen inches. For pain or restlessness physostigmine, gr. $\frac{1}{75}$ + morphia, gr. $\frac{1}{6}$ were given, to be repeated in three hours if necessary. Under such a routine Hill says he has not had in any instance a symptom of shock develop. In two or three cases a condition simulating heart exhaustion was noted, possibly due to overstimulation. It was only transient and the patients responded to stimulants after stopping the pituitrin. After each injection the blood pressure rose. It was during this series that he noted the happy elimination of gas from the alimentary tract, the result of increased peristaltic action.

Eberle uses pituitrin in cases of urinary retention. He thinks

it acts largely through its diuretic action as he has found that adding a little more fluid to a full bladder is often sufficient to originate the necessary reflex. Jaschke reports that there is less need to use the catheter after the injection of pituitrin.

It is obvious, however, that any routine treatment of conditions which may require active surgical interference is not to be desired. Each case should be dealt with on its merits, otherwise there will be not a few instances where pituitrin has been administered in the presence of some mechanical obstruction to the onward passage of the intestinal contents.

According to Prof. Pal of Vienna, who records his experience in the *Medical Record* of July, 1914, pituitary extract is useful in the treatment of exophthalmic goitre. His patient was extremely emaciated and had trembling of the hands and feet. There was marked diarrhoea, insomnia, vomiting, respiratory troubles, a pulsating goitre, von Graefe's sign, etc. Within the course of two months seventy injections of increasing doses of pituitary extract were administered. His weight very soon increased, respiration and sleep improved and the tremor subsided. Although the patient has not been cured, his condition is considerably ameliorated.

In this connexion one might refer to the use made of thymus extract in treating Graves' disease. M. Englander uses it only in those cases where neither medicine nor surgery have had any effect. The case which Englander presented at the Viennese clinic was that of a girl with considerable dilatation of the heart, a systolic murmur and a goitre. Ten weeks' treatment with thymus extract produced a remarkable result. The goitre diminished and the murmur and nervousness disappeared.

Lastly, the following case, from "Progressive Medicine," illustrating the extraordinary use to which some of these extracts may be put, is instructive. A man fifty-four years of age was suffering from chronic rheumatoid arthritis. He was bedridden with all the joints more or less involved. There was extreme wasting, anorexia, sleeplessness with constant pain. He was unable to feed himself, nor could he raise his arms to brush his hair. It was noted that his skin was rough, dry and harsh and that his hair was crisp. His voice was husky and he had a deep suprasternal notch. He was given five grains of thyroid extract three times a day. In a month the result was remarkable. He could struggle on crutches from one room to another, his appetite had returned and the pain was almost gone. In three months he could walk with two sticks and in eighteen months he could walk three miles with one stick.

Thyroid extract is occasionally administered in inoperable malignant disease. On account of its strong catabolic influence it is expected to produce destruction of the growth. In a few instances, at least, it has been attended by a certain amount of improvement.

The relations existing between the various glands of internal secretion are exceedingly intricate and complicated. Yet, one cannot help but feel that when these relationships are finally unravelled, many diseases now considered as largely surgical in character, as, for example, exophthalmic goitre, will be cured by the proper combination of animal extracts.

It was stated by the Minister of Defence of Australia in June that no less than five hundred members, or twenty per cent., of the Australian medical profession were then serving at the front. A good many others have joined the forces since that time. The universities of Sydney, Melbourne and Adelaide have arranged to hold their examinations earlier than usual and the majority of fourth and fifth year students have already made application for military service.

It is estimated that the equipment of the New Zealand hospital ship will cost £25,000. On June 8th, it was stated that £20,000 of this amount had been subscribed and that the work in connexion with the equipment was well advanced.

CAPTAIN R. E. McCONNELL, of Montreal, has been placed in command of the field ambulance detachment clearing hospital and other medical work in the western section of British East Africa.